

**ABSTRACT**

A semiconductor imager chip is mated directly to a laminate-type substrate, such as a printed circuit board. A well is formed by placing a retaining wall on the printed circuit board around the imager chip. An optical material such as a clear polymer is injected into the well to cover the imager chip. After the clear polymer cures (hardens) the retaining wall may be removed. The optical material may also have light filtering or other optical properties in addition to transmissivity. The printed circuit board may have one or more layers. Some of such layers may comprise a ground-plane. High speed digital and analog lines may be strategically routed on the one or more layers to minimize interference with adjacent signal lines. Traditional sockets that receive ceramic or plastic chip carrier packages may be used in embodiments to receive the resultant printed circuit board based chip carrier. The circuit board may comprise a typical multi-component PCB or a chip-on-board carrier design.

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